

We claim:

1. A method for enhancing molecular chaperone activity of α -crystalline (comprising of forms α A-crystalline and α B-crystalline) with a biological compatible amino acid molecule of Arginine-Hydrochloride, said method
5 comprising the steps of:
 - (a) isolating and purifying α -crystalline from calf eye lenses by convention methods (as described in reference 24), and
 - (b) reacting α -crystalline in the presence of phosphate buffer of pH 7.4 with Arg.HCl and insulin or ζ -crystalline in presence or absence of
10 DTT, and
 - (c) observing the enhancement in chaperone activity of α -crystalline in presence of Arg.HCl by fluorescence spectrophotometer.
2. A method as claimed in claim 1, wherein Arginine hydrochloride (Arg. HCl) binds to the peptide backbone and negatively charged side chains of α -
15 crystalline to enhance chaperone activity.
3. A method as claimed in claim 1, wherein Arg.HCl is in the range of about 50 to 350 mM.
4. A method as claimed in claim 3, wherein Arg.HCl is in the range of about 100 to 300 mM.
- 20 5. A method as claimed in claim 1, wherein Arg.HCl enhances the chaperone activity of α -crystalline by about 95%.
6. A method as claimed in claim 5, wherein Arg.HCl enhances the chaperone activity of α -crystalline by about 90%.
7. A method as claimed in claim 1, wherein Arg.HCl enhance the chaperone
25 activity of α -crystalline by about 90% in presence of various aggregation systems.
8. A method as claimed in claim 7, wherein Arg.HCl enhance the chaperone activity of α -crystalline by about 81% in presence of various aggregation systems.
- 30 9. A method as claimed in claim 1 and 7, wherein aggregation systems maybe selected from group comprising of insulin, ζ -crystallin and related compounds.

10. A method as claimed in claim 1, wherein Arg.HCl at a temperature of about 30°C protects the α -crystalline by about 35%.
11. A method as claimed in claim 1, wherein Arg.HCl at a temperature of about 30°C protects the α -crystalline by about 28%.
- 5 12. A method as claimed in claim 1, wherein Arg.HCl brings about subtle changes in the tertiary structure and significant changes in the quaternary structure of both homo-multimers or hetero-multimers of α A-crystalline and α B-crystalline to enhance the chaperone activity.
- 10 13. A method as claimed in claims 1 and 12, wherein presence of Arg.HCl the molecular mass of α -crystalline is reduced ~360 kDa thereby bringing about subtle changes in the tertiary structure and significant changes in the quaternary structure of both homo-multimers or hetero-multimers of α A-crystalline and α B-crystalline to enhance the chaperone activity.
- 15 14. A method as claimed in claim 1, wherein wild type and mutant α A-crystalline are less sensitive to Arg.HCl than α B-crystalline, thereby enhancing the chaperone activity.
- 15 15. A method as claimed in claims 1 and 14, wherein protection of mutant α B-crystalline (R120 α B-crystallin) is about 80% in presence of Arg.HCl.
- 20 16. A method as claimed in claim 15, wherein protection of mutant α B-crystalline (R120 α B-crystallin) is about 75% in presence of Arg.HCl.
17. A method as claimed in claim 1, wherein Arg.HCl enhances the α -crystalline chaperone activity by about 45% by exposing the hydrophobic surfaces of α -crystalline.
- 25 18. A method as claimed in claim 14, wherein Arg.HCl enhances the α -crystalline chaperone activity by about 38% by exposing the hydrophobic surfaces of α -crystalline.